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SUPPLEMENT TO CATALOG NO. 40

Supersedes Pages 105-110 Inclusive

# THE NEW PERMAFLECTOR Fluorescent

## LIGHTING EQUIPMENT

PITTSBURGH REFLECTOR COMPANY
OLIVER BUILDING, PITTSBURGH, PENNSYLVANIA

# PERMAFLECTOR FLUORESCENT EQUIPMENT

- **DESIGNED BY EXPERIENCED ENGINEERS**
- **EMBODIES SOUND, PROVED ILLUMINATION ENGINEERING PRINCIPLES**
- **MANUFACTURED BY AN ESTABLISHED LEADER IN THE LIGHTING FIELD**

The Permaflector Fluorescent Lighting Equipment listed in this Supplement to Catalog No. 40 has been designed by Permaflector Engineers whose technical knowledge and long experience in the lighting field has equipped them to produce a complete line of fluorescent lighting equipment which has been built upon the firm foundation of sound, proved illuminating engineering principles and practices.

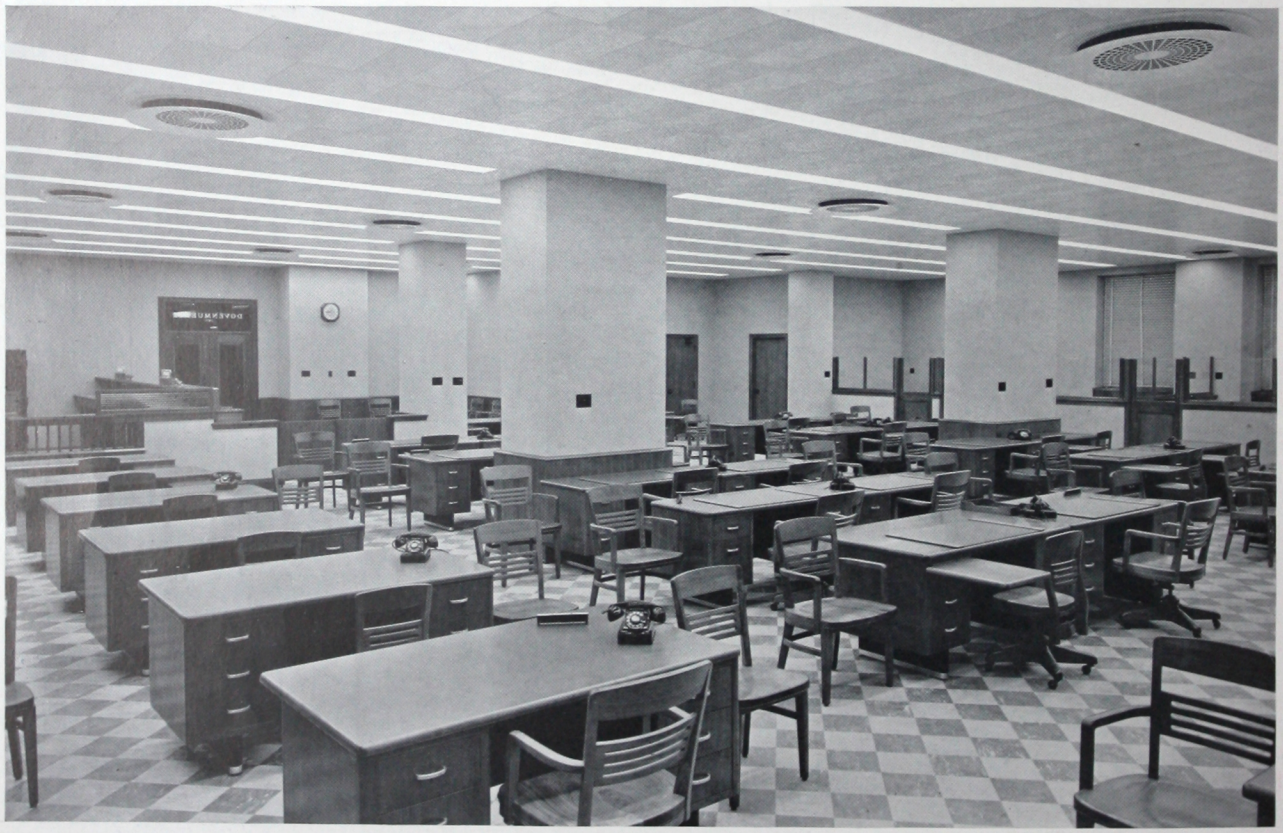
Permaflector Fluorescent Lighting Equipment is manufactured by the Pittsburgh Reflector Company—a dependable name in lighting—an established leader in the lighting field, well known for Permaflectors—the silvered glass reflector with the permanent efficiency. The same skilled workmanship, good design, controlled production and highest grade materials which made Permaflectors preferred as the standard of efficiency in the incandescent lighting field are integrated in Permaflector Fluorescent Units by Permaflector craftsmen.

Permaflector Fluorescent Equipment incorporates many salient and exclusive advantages in design, performance and construction which appeal to those who use fluorescent lighting as well as to those who install or specify fluorescent units. Briefly and generally speaking, they are easily and quickly installed; provide new, improved efficiency and light distribution; include special provisions for quick, trouble-free, economical servicing and maintenance; and, supply special devices which provide peak lamp efficiency and protect the life of the lamps and circuits.

These facts are evident in the specifications and description accompanying each unit listed on the following pages.

Your assurance of the highest standard of quality, performance and economy in fluorescent lighting equipment is the famous Permaflector Trademark embodying the three pyramids—which is stamped on every unit. Make sure it appears on every fluorescent unit you buy, install or specify.

*For Information on the Complete Line of Permaflector Incandescent Lighting Equipment Write for the New Permaflector Catalog Number Forty.*



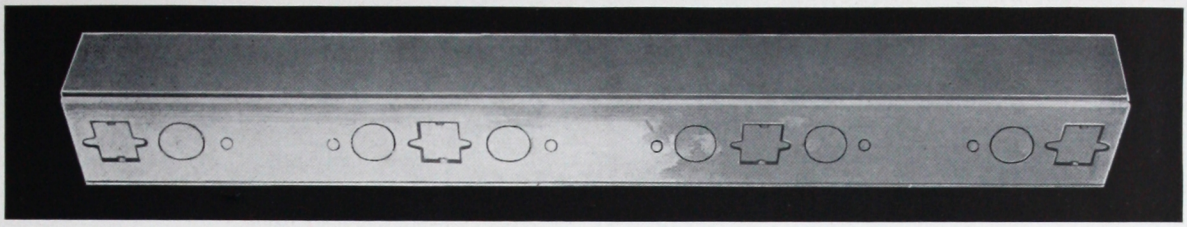
Designer, Paul B. Stevens, Jr.

**A beautiful, efficient installation of Permaflector Fluorescent Troffer No. AF-148-GE in the offices of Dovenmuehle, Inc., Field Building, Chicago. Average intensity is 48 foot candles**

## AUXILIARY EQUIPMENTS

Since Pittsburgh Reflector Company does not manufacture ballasts, starting compensators or lamp holders **we cannot be responsible for defects in these wiring devices.** However, only performance-proved, thoroughly tested equipment is purchased by us from reliable, leading manufacturers for installation in Permaflector Fluorescent Units.

# PERMAFLECTOR FLUORESCENT EQUIPMENT



*(Part of standard section of No. KO-41 showing socket knockouts spaced 6 inches on centers with ¾ inch ends and starter knockouts placed on each side of socket knockout)*

## KNOCKOUT STRIP NO. KO-41 (Not Wired and Not Equipped)

Knockout Strip KO-41 accommodates the FS Lamp Starter and combination lamp holder and starter sockets; also all lamp ballasts of the single-lamp type and all of the two-lamp ballasts except the large "paving brick" type "High Power-Factor Tulamp". KO-41 is constructed of 20 gauge galvanized steel. It consists of two U-Shaped members, the face and the back, which telescope together. Inside dimensions are $2\frac{7}{16}$ inches by 1⅝ inches. Attractive finish is sprayed and baked aluminum. Double-socket knockouts accommodating two lamp sockets back-to-back are spaced 6 inches on centers which is a common factor of eighteen, twenty-four, thirty-six and forty-eight inches (available fluorescent lamp lengths). Therefore, it is always possible to work out the necessary socket locations for the various lamps. Closely spaced ¼-inch knockouts provide for mounting of ballasts, capacitors, starting compensators and Flu-RE-Flectors. Knockouts for FS Starters are properly spaced each side of double socket knockouts. KO-41 is available in seven standard lengths for single lamp installations and series of lamps in line.

| Standard Length | F Lamp Size | Lamp Length | Standard Quantity | Weight Approx. Lbs. | Retail Price Each Length | CODE |
|---|---|---|---|---|---|---|
| 19½″ | 15 Watt | 18″ | 6 | 15 | $0.85 | ONONE |
| 25½″ | 20 Watt | 24″ | 6 | 18 | 1.00 | ONTWO |
| 37½″ | 30 Watt | 36″ | 6 | 28 | 1.40 | ONTRE |
| 49½″ | 40 Watt | 48″ | 6 | 36 | 1.85 | ONFOR |
| 6′-1½″ | Two 30 Watt | 36″ | 6 | 56 | 2.80 | ONSIK |
| 8′-1½″ | Two 40 Watt | 48″ | 6 | 72 | 3.25 | ONATE |
| 9′-7½″ | For Lamps in Line | | 6 | 88 | 3.70 | ONANY |

### ADDITIONAL EQUIPMENT *(For Use With No. KO-41)*

End Caps No. KO-22.

U-Straps No. KO-23 or No. KO-43.

Knockout Covers No. KO-29.

Ballast Connectors No. KO-24.

Ballast Support Clamps No. KO-44.

Symmetric Flu-RE-Flectors:
- No. KO-55-S for 15 Watt 18″ Lamp.
- No. KO-56-S for 20 Watt 24″ Lamp.
- No. KO-57-S for 30 Watt 36″ Lamp.
- No. KO-58-S for 40 Watt 48″ Lamp.

Asymmetric Flu-RE-Flectors:
- No. KO-55-A for 15 Watt 18″ Lamp.
- No. KO-56-A for 20 Watt 24″ Lamp.
- No. KO-57-A for 30 Watt 36″ Lamp.
- No. KO-58-A for 40 Watt 48″ Lamp.

Reflector Ends.
- No. KO-60-S for Symmetric Flu-RE-Flector.
- No. KO-60-A for Asymmetric Flu-RE-Flector.

Reflector Connectors:
- No. KO-59-S for Symmetric Flu-RE-Flector.
- No. KO-59-A for Asymmetric Flu-RE-Flector.

## KNOCKOUT STRIP NO. KO-51 (Not Wired and Not Equipped)

Knockout Strip No. KO-51 is constructed the same as KO-41 except that inside dimensions are larger, 3⅝″ wide by 3″ high. It accommodates the large "paving-brick" type "High Power-Factor Tulamp Ballast." KO-51 is available in three standard lengths.

| Standard Length | F Lamp Size | Lamp Length | Standard Quantity | Weight Approx. Lbs. | Retail Price Each Length | CODE |
|---|---|---|---|---|---|---|
| 6′-1½″ | Two 30 Watt | 36″ | 4 | 60 | $3.70 | TUTRE |
| 8′-1½″ | Two 40 Watt | 48″ | 4 | 80 | 4.65 | TUFOR |
| 9′-7½″ | For Lamps in Line | | 4 | 102 | 5.50 | TUANY |

### ADDITIONAL EQUIPMENT *(For Use With No. KO-51)*

End Caps No. KO-52.

U-Straps No. KO-53

Knockout Covers No. KO-29.

Ballast Connectors No. KO-54.

Ballast Support Clamps No. KO-64.

Symmetric Flu-RE-Flectors:
- No. KO-55-S for 15 Watt 18″ Lamp.
- No. KO-56-S for 20 Watt 24″ Lamp.
- No. KO-57-S for 30 Watt 36″ Lamp.
- No. KO-58-S for 40 Watt 48″ Lamp.

Asymmetric Flu-RE-Flectors:
- No. KO-55-A for 15 Watt 18″ Lamp.
- No. KO-56-A for 20 Watt 24″ Lamp.
- No. KO-57-A for 30 Watt 36″ Lamp.
- No. KO-58-A for 40 Watt 48″ Lamp.

Reflector Ends.
- No. KO-60-S for Symmetric Flu-RE-Flector.
- No. KO-60-A for Asymmetric Flu-RE-Flector.

Reflector Connectors:
- No. KO-59-S for Symmetric Flu-RE-Flector.
- No. KO-59-A for Asymmetric Flu-RE-Flector.

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# KNOCKOUT STRIP NO. KO-61

**(Not Wired and Not Equipped)**

***For installation of 100 watt, 60-inch or 65 watt, 36-inch F lamps***

Knockout Strip No. KO-61, except for the size and location of the knockouts, is identical with KO-51 in dimensions and construction. The knockouts are arranged to accommodate the large lamp holders, starter sockets, FS starters and ballasts required for use with the 100-watt and 65-watt F lamps.

KO-61 is available—NOT WIRED and NOT EQUIPPED—in four standard lengths.

| Standard Length | F Lamps | | | Standard Quantity | Weight Approx. Lbs. | Retail Price, Each Length | CODE |
|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | | | | |
| 36″ | 1 | 65 | 36″ | 4 | 30 | **$2.65** | **TREUN** |
| 60″ | 1 | 100 | 60″ | 4 | 44 | **4.07** | **TRETU** |
| 6′ | 2 | 65 | 36″ | 4 | 53 | **5.10** | **TRETRE** |
| 10′ | 2 | 100 | 60″ | 4 | 88 | **7.96** | **TREFO** |

## ADDITIONAL EQUIPMENT (For use with No. KO-61)

End Caps No. KO-62
U-Straps No. KO-53.
Ballast Support Clamps No. KO-64

# WIRED AND EQUIPPED CONTINUOUS KO-STRIP

We present herewith tabulated data and prices which simplify estimating costs and ordering of continuous runs of WIRED and EQUIPPED Knockout Strip for installation with each of the six F lamps. Actual wiring costs are dependent upon the size and number of lamps installed plus whether or not the lamps are installed with single lamp ballasts or Tulamp ballasts rather than upon the number of feet of strip required. Hence, the following data is based upon the cost "per single lamp length" or "per double lamp length".

Dimensions, type of installation, size of F lamps required and other influencing factors, which determine how continuous runs of KO-Strip are to be cut and wired, differ on each installation. Therefore, each continuous run of WIRED and EQUIPPED KO-Strip must be "tailor-made" to fit each job. Orders must include the length of each continuous run required and should specify whether installation is to be concealed or exposed. Unless otherwise specified on the order, long continuous runs will be wired and equipped for double lamp lengths with Tulamp Ballasts used to the full length or maximum possible length. Single-lamp lengths with Single-Lamp Ballasts will be furnished only as a fill-in to complete the continuous run to the specified length.

Each continuous run includes: the length of Knockout Strip required to accommodate the specified number of lamps with ¾-inch added to each end for attaching End Caps; all stock items required for installation **excepting** End Caps, Flu-RE-Flectors, Reflector Ends and Reflector Connectors; and is WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets. FS starters and F lamps are NOT included.

## FOR SINGLE LAMP INSTALLATIONS

***WIRED and EQUIPPED with SINGLE HIGH POWER FACTOR BALLASTS***

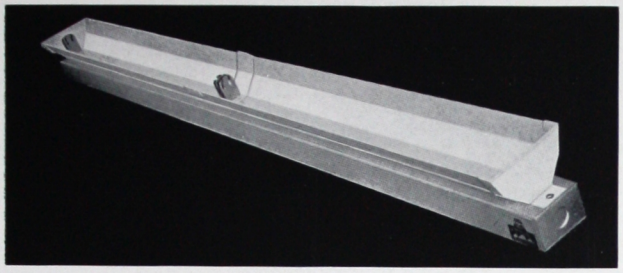
| Catalog Number of KO-Strip | F Lamps | | | Weight Approx. Lbs. (Each Length) | Retail Price (Per Single Lamp Length) |
|---|---|---|---|---|---|
| | Number | Watts | Length | | |
| KO-41 | 1 | 15 | 18″ | 4½ | **$9.07** |
| KO-41 | 1 | 20 | 24″ | 5 | **9.35** |
| KO-41 | 1 | 30 | 36″ | 6 | **11.76** |
| KO-41 | 1 | 40 | 48″ | 8 | **12.96** |
| KO-61 | 1 | 65 | 36″ | 8½ | **17.72** |
| KO-61 | 1 | 100 | 60″ | 14 | **22.74** |

## FOR DOUBLE LAMP INSTALLATIONS (Lamps end-to-end)

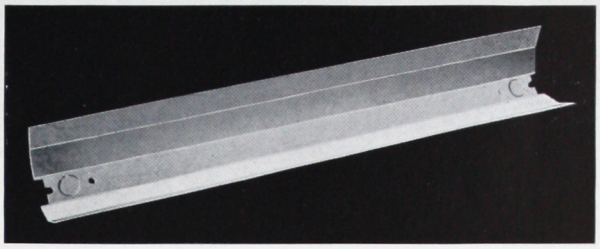
***WIRED and EQUIPPED with TULAMP HIGH POWER FACTOR BALLASTS***

| Catalog Number of KO-Strip | F Lamps | | | Weight Approx. Lbs. (Each Length) | Retail Price (Per ~~Single~~ Double Lamp Length) |
|---|---|---|---|---|---|
| | Number | Watts | Length | | |
| KO-41 | 2 | 15 | 18″ | 11 | **$12.98** |
| KO-41 | 2 | 20 | 24″ | 13 | **13.44** |
| KO-41 | 2 | 30 | 36″ | 15 | **18.61** |
| KO-41 | 2 | 40 | 48″ | 18 | **19.81** |
| KO-61 | 2 | 65 | 36″ | 13 | **26.35** |
| KO-61 | 2 | 100 | 60″ | 41 | **36.37** |

# PERMAFLECTOR FLUORESCENT EQUIPMENT



(Flu-RE-Flectors Mounted on KO-41)



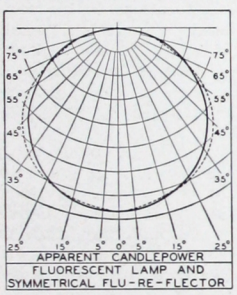
(Flu-RE-Flector No. KO-55-S)

## FLU-RE-FLECTORS

Pittsburgh Flu-RE-Flectors are trough reflectors shaped as shown, made of steel with white baked-on, heat-resisting enamel finish of highest reflectivity attainable.

For symmetric distribution knockouts are placed in center face of reflector. For asymmetric distribution knockouts are placed in side face of reflector. Since each reflector contains only one set of knockouts it may be fastened only in one position. Therefore, when ordering specify either the "S" type for symmetric position or "A" type for asymmetric position.

Single socket knockouts in ends of Flu-RE-Flectors accommodate a single socket and extend the reflector to full length of lamp and socket. To attach the reflector to face of KO-41 and KO-51 specially designed oversize screws are furnished which are inserted in ¼" knockouts in face of KO Strip. These screws cut their own threads in KO Strip and when tightened draw up reflector firmly and securely against face of KO Strip. This operation may be executed after the KO Strip has been wired, assembled and installed. Each Flu-RE-Flector may be used singly for single lamp installations. For a series of lamps in line the gap between adjacent reflectors is filled in by No. KO-59-S (Reflector Connector) for symmetric position and No. KO-59-A (Reflector Connector) for asymmetric position of reflector.




(Characteristic light distribution of Flu-RE-Flector and fluorescent lamp — symmetric position).

Solid Line— plane of lamp axis.

Dotted Line— plane perpendicular to lamp axis.

### SYMMETRIC FLU-RE-FLECTORS

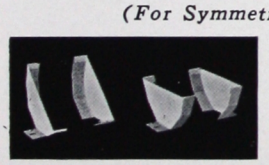
| Catalog No. | F Lamp Size | Lamp Length | Standard Quantity | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|
| KO-55-S | 15 Watt | 18″ | 10 | 13 | $0.95 | KOFIFIS |
| KO-56-S | 20 Watt | 24″ | 10 | 15 | 1.25 | KOFISS |
| KO-57-S | 30 Watt | 36″ | 10 | 25 | 1.50 | KOFSETS |
| KO-58-S | 40 Watt | 48″ | 10 | 33 | 1.80 | KOFATES |

### ASYMMETRIC FLU-RE-FLECTORS

| Catalog No. | F Lamp Size | Lamp Length | Standard Quantity | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|
| KO-55-A | 15 Watt | 18″ | 10 | 13 | $0.95 | KOFIFA |
| KO-56-A | 20 Watt | 24″ | 10 | 15 | 1.25 | KOFISA |
| KO-57-A | 30 Watt | 36″ | 10 | 25 | 1.50 | KOFSETA |
| KO-58-A | 40-Watt | 48″ | 10 | 33 | 1.80 | KOFATA |

## REFLECTOR END NO. KO-60-S

*(For Symmetric Flu-RE-Flectors)*



(Flu-RE-Flector End's No's. KO-60-A, KO-60-S)

Reflector End No. KO-60-S is designed to fit snugly and neatly over the ends of the Flu-RE-Flector. End Cap screw inserted through hole in extended edge holds reflector end in position.

KO-60-S is for use with all full-length Flu-RE-Flectors mounted on KO-41 or KO-51 in symmetric position.

**Standard Quantity**—10 **Weight,** Approx. 1 lb.
**Retail Price, Each** ..... $0.30
**Code** ..... KOSIXS

## REFLECTOR END NO. KO-60-A

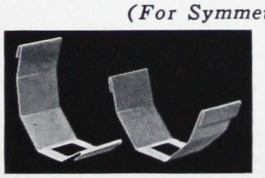
*(For Asymmetric Flu-RE-Flectors)*

Same as Reflector End No. KO-60-A except it is for use only with asymmetric Flu-RE-Flectors.

**Standard Quantity**—10 **Weight,** Approx. 1 lb.
**Retail Price, Each** ..... $0.30
**Code** ..... KOSIKA

## REFLECTOR CONNECTOR NO. KO-59-S

*(For Symmetric Flu-RE-Flectors)*



(Flu-RE-Flector Connectors No's. KO-59-A, KO-59-S)

No. KO-59-S Reflector Connector is used to join adjacent sections of KO-55-S, KO-56-S, KO-57-S or KO-58-S reflectors mounted on KO-41 or KO-51 in symmetric position.

**Standard Quantity**—10
**Weight,** Approx. 4 lbs.
**Retail Price, Each** ..... $0.30
**Code** ..... KOFNIS

## REFLECTOR CONNECTOR NO. KO-59-A

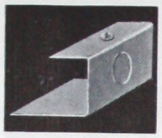
*(For Asymmetric Flu-RE-Flectors)*

No. KO-59-A is used to join adjacent sections of KO-55-A, KO-56-A, KO-57-A or KO-58-A reflectors mounted on KO-41 or KO-51 in asymmetric position.

**Standard Quantity**—10 **Weight,** Approx. 4 lbs.
**Retail Price, Each** ..... $0.30
**Code** ..... KOFNIA

# PERMAFLECTOR FLUORESCENT EQUIPMENT

## END CAP NO. KO-22



KO-22

End Cap No. KO-22 covers end of the KO-41 Knockout Strip and one-half of the last knockout at end, where only one socket will be used. End Cap KO-22 has standard ½" knockout in end face for service connection.

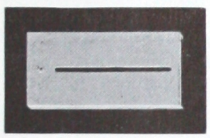
**Standard Quantity**—10 **Weight,** Approx. 1¾ lbs.
**Retail Price, Each** ..... **$0.18**
**Code** ..... **KOTUT**

## END CAP NO. KO-52

End Cap No. KO-52 is similar to KO-22 but is of larger size for use with Knockout Strip No. KO-51.

**Standard Quantity**—10 **Weight,** Approx. 4 lbs.
**Retail Price, Each** ..... **$0.18**
**Code** ..... **KOFTU**

## BALLAST CONNECTOR NO. KO-24



KO-24

Ballast Connector No. KO-24 saves time and labor of drilling extra holes by adapting the ballast regardless of length, to the standard ¼ inch knockouts in KO-41.

KO-24 is equipped with a stud and nut which is attached to one end of the ballast. The elongated slot supplies the necessary adjustability for attaching to the nearest ¼ inch knockout in the face of KO-41.

In addition to the stud and nut KO-24 is furnished with two machine screws and nuts in order to fasten the auxiliary at each end.

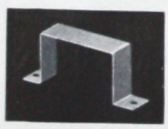
**Standard Quantity**—10 **Weight,** Approx. 1¾ lbs.
**Retail Price, Each** ..... **$0.24**
**Code** ..... **KOTFO**

## BALLAST CONNECTOR NO. KO-54

Ballast Connector KO-54 is similar to KO-24 but is of larger size to accommodate the "High Power-Factor Tulamp Type Ballast" for use in Knockout Strip No. KO-51 or KO-61.

**Standard Quantity**—10 **Weight,** Approx. 3 lbs.
**Retail Price, Each** ..... **$0.30**
**Code** ..... **KOFFO**

## U-STRAP NO. KO-23

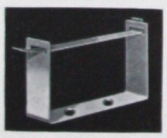


KO-23

No. KO-23 firmly supports Knockout Strip No. KO-41 on any flat, vertical or horizontal surface.

**Standard Quantity**—10
**Weight,** Approx. 1 lb.
**Retail Price, Each** ..... **$0.12**
**Code** ..... **KOTRE**

## U-STRAP NO. KO-43



KO-43

No. KO-43 performs same function as KO-23. New strip and slot method permits removal of KO-41 without removing screws or U-Strap from mounting surface.

**Standard Quantity**—10
**Weight,** Approx. 1 lb.
**Retail Price, Each** ..... **$0.18**
**Code** ..... **KOFTRE**

## U-STRAP NO. KO-53

U-strap No. KO-53 is similar to KO-43 but is of larger size for use with Knockout Strip No. KO-51 or KO-61.

**Standard Quantity**—10 **Weight,** Approx. 1 lb.
**Retail Price, Each** ..... **$0.23**
**Code** ..... **KOFIRE**

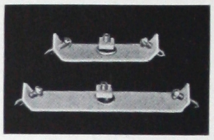
## KNOCKOUT COVER NO. KO-29

No. KO-29

Knockout Cover No. KO-29 consists of a flat metal plate of proper dimensions as shown to cover one-half of a knockout when only one socket is installed therein. It is not required at standard ends. It has a tapped hole and machine screw for fastening in place. KO-29 goes inside of KO-41 or KO-51 face against the socket and is drawn up tightly by means of a machine screw.

**Standard Quantity**—10 **Weight,** Approx. 10 oz.
**Retail Price, Each** ..... **$0.09**
**Code** ..... **KOTNIN**

## BALLAST SUPPORT CLAMP NO. KO-44

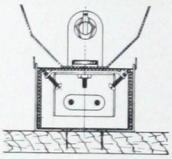


Ballast Support Clamps No's KO-44, KO-64

Ballast Support Clamp No. KO-44 is a shaped metal strip, designed as illustrated, containing two special screws and a stud and nut for attaching the ballast. The pressure of the two screws against the corners of the knockout strip draws the ballast up tightly against the face of the channel and holds the ballast firmly in position. This quick, simple method eliminates the use of holes or knockouts. KO-44 is for use only with Knockout Strip No. KO-41.

**Standard Quantity**—10 **Weight,** Approx. ½ lb.
**Retail Price, Each** ..... **$0.18**
**Code** ..... **KOFOFO**

## BALLAST SUPPORT CLAMP NO. KO-64



Ballast Support Clamps and Ballast Installed in KO-41

Ballast Support Clamp No. KO-64 is similar to KO-44 but is of larger size for use in Knockout Strip No. KO-51 or KO-61.

**Standard Quantity**—10
**Weight,** Approx. 1 lb.
**Retail Price, Each** ..... **$0.18**
**Code** ..... **KOSIFO**

## END CAP NO. KO-62

End Cap No. KO-62 fits inside the end of Knockout Strip No. KO-61 covering the end and is cut out at the top to insert around the single end socket. End Cap No. KO-62 has standard ½" knockout in end face for service connection.

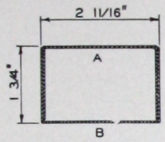
**Standard Quantity**—10 **Weight,** Approx. 5 lbs.
**Retail Price, Each** ..... **$0.26**
**Code** ..... **KOSITU**

Doubleday Doran Book Shop, New York City.
Architects, Dawson & Oliver.
Electrical Contractor, Underwriters' Electric Co.

**KO-Strip and F Lamps in Cove Installation**

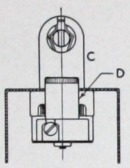
# ASSEMBLING PERMAFLECTOR FLUORESCENT KO-STRIP

**NOTE:** The same assembly procedure as shown here for Knockout Strip No. KO-41 is also used for Knockout Strip No. KO-51 (Mogul Size).



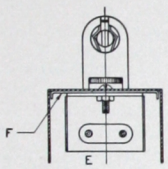
*(Sketch 1)*

**Sketch 1**—(A) represents face of knockout strip No. KO-41 which easily and snugly slides into back (B) completing a rectangular shaped metal duct in which wiring, auxiliaries, capacitors, sockets and starters are installed.



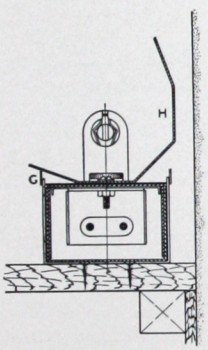
*(Sketch 2)*

**Sketch 2**—The back of KO-41 is removed during installation of starters, sockets, auxiliaries, U-straps, wiring and Flu-RE-Flectors. Lampholder and starter socket (C) is installed in knockout in face of KO-41 and fastened tightly in exact position with screw and nut. Starter (D) may then be inserted in starter socket through knockout in face of KO-41.



*(Sketch 3)*

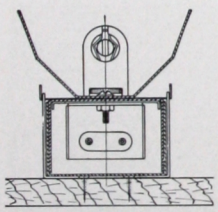
**Sketch 3**—Auxiliary (E) centered between sockets is attached to inside surface of face to KO-41 by means of Ballast Connector (F) or Ballast Support Clamp.



*(Sketch 4)*

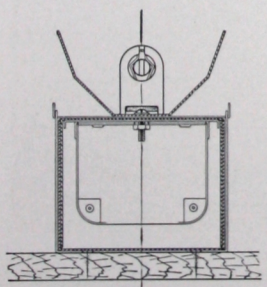
**Sketch 4**—Flu-RE-Flector (H) is placed over the face of KO-41 between sockets in asymmetric position and attached by means of special screws through $\frac{5}{16}$" holes knocked out. Reflector Ends are slipped on ends of Flu-RE-Flector. After assembly is wired the back of KO-41 is then telescoped into position over the face and the assembly is completed by the addition of End Caps. U-Strap (G) is attached to mounting surface. The assembly is placed therein and metal strap inserted through slots of U-Strap and between reflector and face of KO-41.

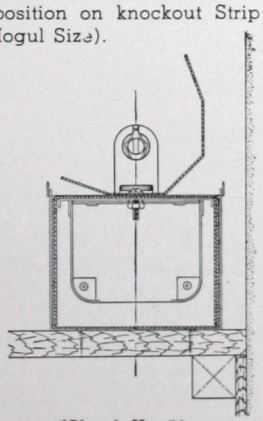
**Sketch 5**—Flu-RE-Flector mounted in symmetric position.


*(Sketch 5)*

**Sketch 6**—Flu-RE-Flector mounted in symmetric position on Knockout Strip No. KO-51 (Mogul Size). Note larger size of KO-51 and position of new "High Power-Factor Tulamp Ballast" installed inside KO-51.

**Sketch 7**—Flu-RE-Flector mounted in asymmetric position on knockout Strip No. KO-51 (Mogul Size).


*(Sketch No. 6)*


*(Sketch No. 7)*

## HOW TO JOIN SECTIONS OF KO-41 OR KO-51 STRIP FOR CONTINUOUS UNBROKEN LAMP INSTALLATIONS

Extra length of KO-41 or KO-51 Strip may be joined to a standard length by a few simple cuts. The desired extra length is measured from the end of the new section and the **face only** cut at that point. The back of the strip is cut some inches beyond the face cut which allows it to extend. The end of the standard length is cut in the opposite manner. That is, the **back only** is cut measuring the same as the extension of the back of the new section. In this manner, male and female ends are created which are easily and snugly joined to make a clean, neat joint.

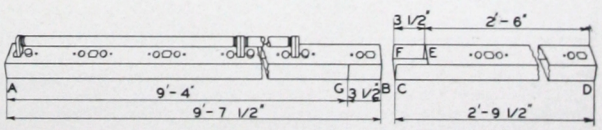
Dimension of cut to be made in the face of the new section is, of course, determined by the size and spacing of the lamps. Care must be exercised, so that after cutting and joining, the knockouts in the new section are spaced correctly for the additional lamps. The following actual problem demonstrates this method.

**PROBLEM:** Make a continuous unbroken installation of **eight** 18" lamps using standard lengths of KO-41 Strip.

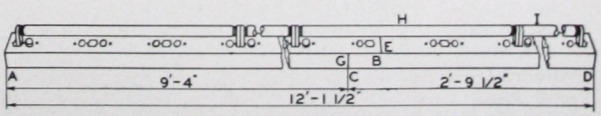
**SOLUTION: Sketch 8**—A to B represents a standard 9' 7½" section of KO-41 Strip with six 18" lamps mounted; 6¾" remain of this standard length. Therefore, we need only 30" additional strip to accommodate the two additional lamps. We measure 30" **from the end** of the new length of KO Strip and cut the **face only** as shown at point E. **The KO Strip must be reversed so that the newly cut end is used for joining.** We then cut the **back** 3½" (or 4" if desired) longer to point F which creates an extension or female end.

Standard length A to B is then furnished with a male end by cutting the **back only** 3½" (or 4" if desired) shorter as shown.

**Sketch 9**—Standard Section A to B and New Section C to D simply slide together at E and G, completing the joint and additional lamps H and I are then accommodated. The new end is a standard end of KO-41 equipped with End Cap KO-22.



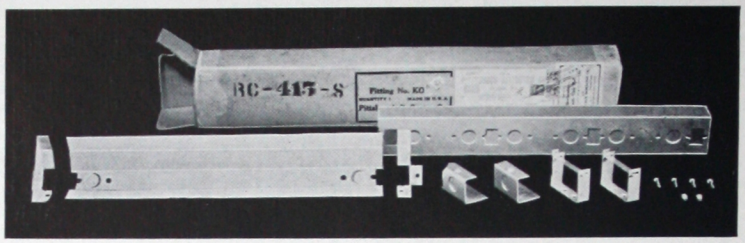
*(Sketch No. 8)*



*(Sketch No. 9)*

# "READY-CUT" FLUORESCENT UNITS

**(Available NOT WIRED or WIRED and EQUIPPED)**




**RC-415-S as Shipped**

"Ready-Cut" for single-lamp units or two-lamp units (lamps end-to-end) in a full range of sizes to accommodate F lamps from 15 watts to 100 watts, consist of the appropriate length of Knockout Strip and the necessary assortment of stock items. A single catalog number covering the various assortments and combinations makes ordering simple. Each "Ready Cut" unit NOT WIRED and NOT EQUIPPED is shipped knocked down ready for wiring and assembling in a single package.

†Permaflector "Ready-Cut" Fluorescent Units tabulated below containing the suffix letter "E" are WIRED and EQUIPPED with ballasts, starting compensators lampholders and starter sockets. FS starters and F lamps are NOT included. Single lamp ballasts are furnished with the single lamp units and two lamp ballasts are furnished with the two lamp units. WIRED and EQUIPPED "Ready-Cut" units include all stock items listed above the catalog numbers excepting Ballast Support Clamps. Ballasts are bolted to the face of the KO-Strip.

Limiting devices supplied with Permaflector "Ready-Cut" Units are for use with 110-125 Volt, 60 Cycle, AC Current. They provide high power factor of 95-100 per cent and minimize cyclic flicker. Starting Compensators, which are often eliminated to decrease the cost of the fixtures, are always supplied with Permaflector Fluorescent Equipment as they insure satisfactory lamp life and lumen maintenance.

WIRED and EQUIPPED "Ready-Cut" Units are shipped assembled ready for installation with knockout in end cap and lead wire for service connection. When Flu-RE-Flector is included it is shipped separately in the same package and must be attached to the Knockout Strip at the time of installation.

## "READY-CUT" SINGLE FLUORESCENT UNITS

*(Without Flu-RE-Flector)*

**Consist of:**

1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
2—U-Straps No. KO-43
2—Ballast Support Clamps No. KO-44

| Catalog No. | Overall Length | F Lamp Size | Standard Quantity | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|
| RC-415 | 19½" | 15 Watt | 1 | 5 | $ 2.19 | FONFI |
| †RC-415-E | 19½" | 15 Watt | 1 | 7 | 9.43 | FONFIE |
| RC-420 | 25½" | 20 Watt | 1 | 5½ | 2.45 | FONTU |
| †RC-420-E | 25½" | 20 Watt | 1 | 7 | 9.69 | FONTUE |
| RC-430 | 37½" | 30 Watt | 1 | 6½ | 2.70 | FONRE |
| †RC-430-E | 37½" | 30 Watt | 1 | 9 | 12.04 | FONREE |
| RC-440 | 49½" | 40 Watt | 1 | 8½ | 3.15 | FONFO |
| †RC-440-E | 49½" | 40 Watt | 1 | 11 | 13.26 | FONFOE |

## "READY-CUT" SINGLE FLUORESCENT UNITS

*(With Symmetric Flu-RE-Flector)*

**Consist of:**

1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
2—U-Straps No. KO-43
2—Ballast Support Clamps No. KO-44
1—Flu-RE-Flector
2—Reflector Ends No. KO-60-S

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-415-S | 19½" | 15 Watt | 1 | 6½ | 3.70 | FONES |
| †RC-415-SE | 19½" | 15 Watt | 1 | 8 | 10.98 | FONESE |
| RC-420-S | 25½" | 20 Watt | 1 | 7 | 4.10 | FOTUS |
| †RC-420-SE | 25½" | 20 Watt | 1 | 8 | 11.39 | FOTUSE |
| RC-430-S | 37½" | 30 Watt | 1 | 9½ | 4.75 | FOTES |
| †RC-430-SE | 37½" | 30 Watt | 1 | 13 | 14.11 | FOTESE |
| RC-440-S | 49½" | 40 Watt | 1 | 12 | 5.50 | FOFOS |
| †RC-440-SE | 49½" | 40 Watt | 1 | 15 | 15.67 | FOFOSE |

## "READY-CUT" SINGLE FLUORESCENT UNITS

*(With Asymmetric Flu-RE-Flector)*

**Consist of:**

1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
2—U-Straps No. KO-43
2—Ballast Support Clamps No. KO-44
1—Flu-RE-Flector
2—Reflector Ends No. KO-60-A

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-415-A | 19½" | 15 Watt | 1 | 6½ | 3.70 | FONA |
| †RC-415-AE | 19½" | 15 Watt | 1 | 8 | 10.98 | FONAE |
| RC-420-A | 25½" | 20 Watt | 1 | 7 | 4.10 | FOTUA |
| †RC-420-AE | 25½" | 20 Watt | 1 | 8 | 11.39 | FOTUAE |
| RC-430-A | 37½" | 30 Watt | 1 | 9½ | 4.75 | FOTRA |
| †RC-430-AE | 37½" | 30 Watt | 1 | 13 | 14.11 | FOTRAE |
| RC-440-A | 49½" | 40 Watt | 1 | 12 | 5.50 | FOFA |
| †RC-440-AE | 49½" | 40 Watt | 1 | 15 | 15.67 | FOFAE |

# "READY-CUT" FLUORESCENT UNITS

## "READY-CUT" DOUBLE FLUORESCENT UNITS
*(Without Flu-RE-Flector)*

**Consist of:**
1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
3—U-Straps No. KO-43
4—Ballast Support Clamps No. KO-44

| Catalog No. | Overall Length | F Lamp Size | Standard Quantity | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|
| RC-432 | 6′-1½″ | 2-30 Watt | 1 | 9 | $ 4.80 | FOTATU |
| †RC-432-E | 6′-1½″ | 2-30 Watt | 1 | 15 | 19.44 | FOTATUE |
| RC-442 | 8′-1½″ | 2-40 Watt | 1 | 12 | 5.30 | FOFATU |
| †RC-442-E | 8′-1½″ | 2-40 Watt | 1 | 18 | 20.11 | FOFATUE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS
*(With Symmetric Flu-RE-Flector)*

**Consist of:**
1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
3—U-Straps No. KO-43
4—Ballast Support Clamps No. KO-44
2—Flu-RE-Flectors
2—Reflector Ends No. KO-60-S
1—Reflector Connector No. KO-59-S

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-432-S | 6′-1½″ | 2-30 Watt | 1 | 17 | 8.70 | FOTEUES |
| †RC-432-SE | 6′-1½″ | 2-30 Watt | 1 | 23 | 23.30 | FOTEUESE |
| RC-442-S | 8′-1½″ | 2-40 Watt | 1 | 19 | 9.75 | FOFOTUES |
| †RC-442-SE | 8′-1½″ | 2-40 Watt | 1 | 25 | 24.56 | FOFOTUESE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS
*(With Asymmetric Flu-RE-Flector)*

**Consist of:**
1—Length of No. KO-41, Ready-Cut
2—End Caps No. KO-22
3—U-Straps No. KO-43
4—Ballast Support Clamps No. KO-44
2—Flu-RE-Flectors
2—Reflector Ends No. KO-60-A
1—Reflector Connector No. KO-59-A

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-432-A | 6′-1½″ | 2-30 Watt | 1 | 17 | 8.70 | FOTRATUA |
| †RC-432-AE | 6′-1½″ | 2-30 Watt | 1 | 23 | 23.30 | FOTRATUAE |
| RC-442-A | 8′-1½″ | 2-40 Watt | 1 | 19 | 9.75 | FOFATUA |
| †RC-442-AE | 8′-1½″ | 2-40 Watt | 1 | 25 | 24.56 | FOFATUAE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS (KO-51 SIZE)
*(Without Flu-RE-Flector)*

**Consist of:**
1—Length of KO-51, Ready-Cut
2—End Caps No. KO-52
3—U-Straps No. KO-53
4—Ballast Support Clamps No. KO-64

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-530 | 6′-1½″ | 2-30 Watt | 1 | 19 | 5.50 | FITRY |
| †RC-530-E | 6′-1½″ | 2-30 Watt | 1 | 28 | 20.19 | FITRYE |
| RC-540 | 8′-1½″ | 2-40 Watt | 1 | 22 | 6.50 | FITOY |
| †RC-540-E | 8′-1½″ | 2-40 Watt | 1 | 31 | 21.31 | FITOYE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS
*(With Symmetric Flu-RE-Flector)*

**Consist of:**
1—Length of KO-51, Ready-Cut
2—End Caps No. KO-52
3—U-Straps No. KO-53
4—Ballast Support Clamps No. KO-64
2—Symmetric Flu-RE-Flectors
2—Reflector Ends No. KO-60-S
1—Reflector Connector No. KO-59-S.

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-530-S | 6′-1½″ | 2-30 Watt | 1 | 24½ | 9.25 | FITES |
| †RC-530-SE | 6′-1½″ | 2-30 Watt | 1 | 34 | 23.89 | FITESE |
| RC-540-S | 8′-1½″ | 2-40 Watt | 1 | 30½ | 10.90 | FIFOS |
| †RC-540-SE | 8′-1½″ | 2-40 Watt | 1 | 39 | 25.76 | FIFOSE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS
*(With Asymmetric Flu-RE-Flector)*

**Consist of:**
1—Length of KO-51, Ready-Cut
2—End Caps No. KO-52
3—U-Straps No. KO-53
4—Ballast Support Clamps No. KO-64
2—Asymmetric Flu-RE-Flectors
2—Reflector Ends No. KO-60-A
1—Reflector Connector No. KO-59-A

| | | | | | | |
|---|---|---|---|---|---|---|
| RC-530-A | 6′-1½″ | 2-30 Watt | 1 | 24½ | 9.25 | FITAY |
| †RC-530-AE | 6′-1½″ | 2-30 Watt | 1 | 34 | 23.89 | FITAYE |
| RC-540-A | 8′-1½″ | 2-40 Watt | 1 | 30½ | 10.90 | FIFOY |
| †RC-540-AE | 8′-1½″ | 2-40 Watt | 1 | 39 | 25.76 | FIFOYE |

## "READY-CUT" SINGLE FLUORESCENT UNITS (KO-61 SIZE)
*(Without Flu-RE-Flector)*

**Consist of:**
1—Length of No. KO-61, Ready-Cut
2—End Caps No. KO-62
2—Ballast Support Clamps No. KO-64
2—U-Straps No. KO-53

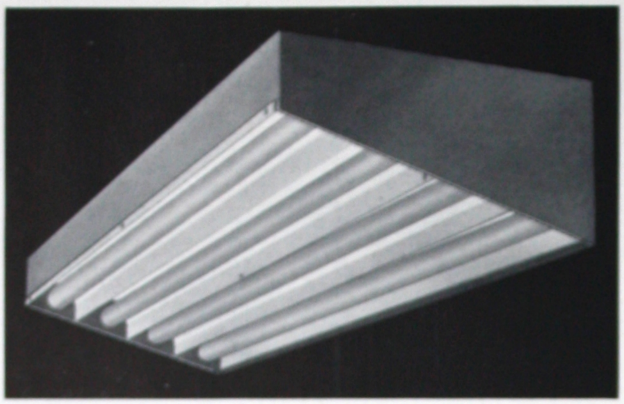
| | | | | | | |
|---|---|---|---|---|---|---|
| RC-3101 | 36″ | 65 Watt | 1 | 9 | 4.22 | TREUNO |
| †RC-3101-E | 36″ | 65 Watt | 1 | 19 | 18.17 | TREUNOE |
| RC-5101 | 60″ | 100 Watt | 1 | 14 | 5.74 | FIUN |
| †RC-5101-E | 60″ | 100 Watt | 1 | 30 | 23.26 | FIUNE |

## "READY-CUT" DOUBLE FLUORESCENT UNITS (KO-61 SIZE)
*(Without Flu-RE-Flector)*

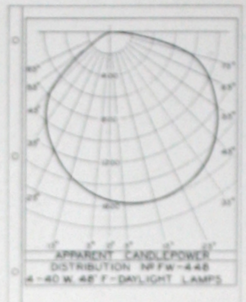
**Consist of:**
1—Length of No. KO-61, Ready-Cut
2—End Caps No. KO-62
2—Ballast Support Clamps No. KO-64
4—U-Straps No. KO-53

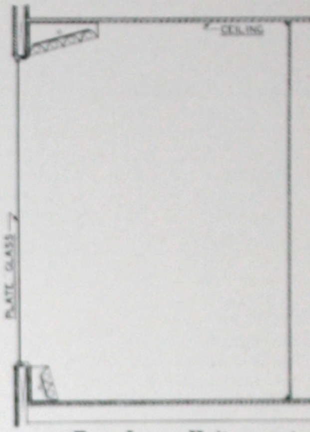
| | | | | | | |
|---|---|---|---|---|---|---|
| RC-3102 | 6′ | 2-65 Watt | 1 | 13 | 7.17 | TREUNTU |
| †RC-3102-E | 6′ | 2-65 Watt | 1 | 34 | 26.80 | TREUNTUE |
| RC-5102 | 6′ | 2-100 Watt | 1 | 26 | 10.00 | FIUNTU |
| †RC-5102-E | 6′ | 2-100 Watt | 1 | 41 | 37.19 | FIUNTUE |

# ASYMMETRIC FLUORESCENT UNITS "FW" SERIES

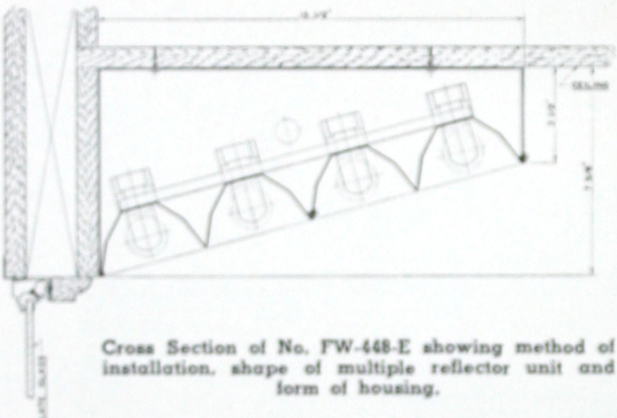


Permaflector Asymmetric Unit No. FW-448-E for use with four 40 watt, 48-inch F lamps.




Permaflector Asymmetric Fluorescent Four Lamp Unit mounted in show window for down lighting and Two-Lamp Unit installed as footlight in bottom of window.



Cross Section of No. FW-448-E showing method of installation, shape of multiple reflector unit and form of housing.

**All Permaflector "FW" Series Units are ONLY available WIRED and EQUIPPED with ballasts, starting compensator, lamp holders and starter sockets. FS starters and F lamps are not included.**

Limiting devices supplied with Permaflector "FW" Series Units are for use with 110-125 Volt, 60 Cycle, AC current. They provide high power factor of 95-100%, and minimize cyclic flicker. Starting compensators, which are often eliminated to decrease the cost of the fixtures are always supplied with Permaflector Fluorescent Equipment as they insure satisfactory lamp life and lumen maintenance.

## APPLICATION AND DESCRIPTION

Permaflector Asymmetric Fluorescent Units "FW" Series are designed primarily for show window lighting—either for ceiling surface mounting or for floor mounting as window footlights. They may also be installed with excellent results for display lighting such as rug racks, over display counters, fitting rooms, wall niches, as well as store fronts, art galleries, wall murals and similar locations.

These asymmetric type units are available for installation therein of two lamps or four lamps in 20 watt, 24-inch; 30 watt, 36-inch; or 40 watt, 48-inch sizes.

Permaflector "FW" Series Units consist of a metal trough enclosure which is attached to the mounting surface and supports the reflector unit. The reflector unit is made up of a series of trough reflectors which are joined adjacently into a single piece which is mounted in the enclosure at an angle. This angle type construction accomplishes the twofold purpose of providing efficient asymmetric light distribution and locating the lamps out of the range of vision of the window shoppers. The multiple reflector unit design method utilizes the maximum output of each individual lamp.

Limiting devices, wiring, sockets, F Lamps and starters are mounted on the inner and outer surfaces of the multiple reflector unit. Hence, all functional parts may be removed as a single unit for servicing at a work bench by merely removing the three screws which hold the reflector unit in position and detaching the wire leads.

Installation of "FW" Series Units is made by attaching the enclosure to the mounting surface by means of screws as illustrated in the accompanying cross section sketch. A knockout is furnished at the end of the housing for the service connection.

Metal housing and multiple reflector unit are both constructed of heavy gauge sheet steel. Attractive sprayed and baked aluminum finish is applied to the housing while the multiple reflector unit is finished in a special durable, baked on heat-resisting white enamel of highest reflectivity attainable.

## TWO LAMP UNITS

**Wired with One Tulamp Ballast** — **Standard Quantity 1**

| Catalog No. | F Lamps | | | Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Width | Length | Max. Depth | | | |
| FW-224-E | 2 | 20 | 24" | 7¼" | 24" | 6½" | 17 | $21.78 | EFSHOUN |
| FW-236-E | 2 | 30 | 36" | 7¼" | 36" | 6½" | 24 | 25.56 | EFSHOTU |
| FW-248-E | 2 | 40 | 48" | 7¼" | 48" | 6½" | 30 | 30.66 | EFSHOTRE |

## FOUR LAMP UNITS

**Wired with Two Tulamp Ballasts** — **Standard Quantity 1**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| FW-424-E | 4 | 20 | 24" | 15½" | 24" | 7⅝" | 33 | 36.18 | EFSHOFO |
| FW-436-E | 4 | 30 | 36" | 15½" | 36" | 7⅝" | 48 | 44.12 | EFSHOFI |
| FW-448-E | 4 | 40 | 48" | 15½" | 48" | 7⅝" | 73 | 47.78 | EFSHOSI |

# RECESSED TULAMP FLUORESCENT UNITS "RF" SERIES

**Available WIRED and EQUIPPED ONLY**

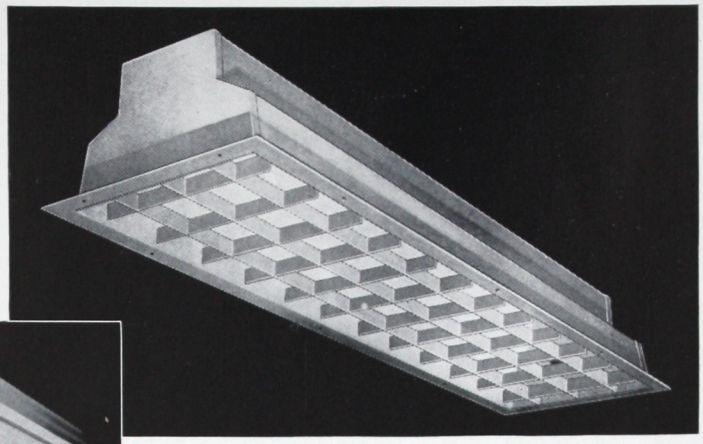
Each unit consists of an inverted trough-shaped housing, removable V-shaped trough inner section and a hinged eggcrate louver. The V-shaped trough telescopes into the inverted housing, serves as part of the reflecting surface and may be removed easily at any time for servicing of limiting devices. The eggcrate louver may be swung open permitting free, easy access to lamps and starters by releasing the two knurled head screws that hold the louver in position.

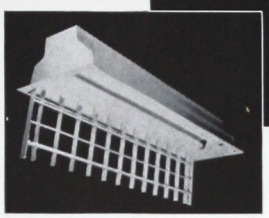
Unit may be installed in wood ceiling by means of wood screws through the flange of the housing; or, in plaster ceiling by the use of the plaster frame which is set in the ceiling when it is plastered.

"RF" Units are attractively finished in durable sprayed and baked heat-resisting white enamel of highest reflectivity attainable. Units are WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets — FS starters and F lamps are NOT included.

**Standard Quantity**—1

**One High Power Factor Tulamp Ballast Furnished with Wired Units**





**Pittsburgh Fluorescent Tulamp Recessed Unit No. RF-236-Louver closed**

**Louver Open for Servicing Lamps and Cleaning**

| Catalog Number | F Lamps | | | Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Watts | Length | Overall | Depth | Opening In Ceiling | | | |
| RF-224-E | 2 | 20 | 24″ | 26″ x 10¾″ | 6″ | 24½″ x 9″ | 15 | $36.36 | AREFTUE |
| RF-236-E | 2 | 30 | 36″ | 38″ x 10¾″ | 6″ | 36½″ x 9″ | 20 | 42.10 | AREFSE |
| RF-248-E | 2 | 40 | 48″ | 50″ x 10¾″ | 6″ | 48½″ x 9″ | 30 | 44.88 | AREFAE |
| Plaster Ring No. 224 | | | | | | | | 2.88 | |
| No. 236 | | | | | | | | 3.33 | |
| No. 248 | | | | | | | | 3.78 | |

# INDUSTRIAL FLUORESCENT UNIT NO. IF-248-E

**Available WIRED and EQUIPPED ONLY**

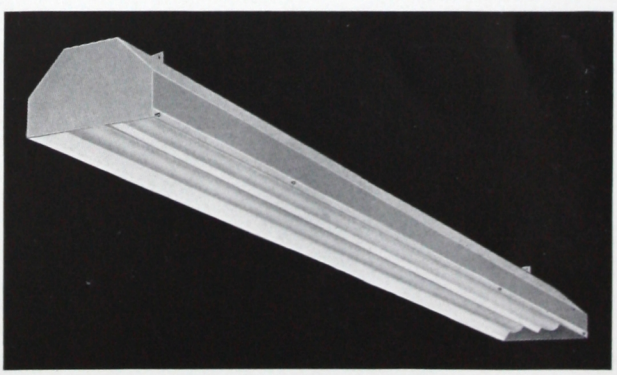
No. IF-248-E offers industrial users of fluorescent lighting the increased efficiency of the multiple reflector unit design method which utilizes the maximum output of each individual lamp and provides adequate lateral screening of the lamps.

This industrial unit is constructed of heavy sheet steel; consists of a housing, shaped as illustrated, which encloses all auxiliaries and lamps and supports the multiple reflector unit. This reflector unit can be quickly and easily removed for cleaning of the reflecting surface and servicing of auxiliaries without detaching lampholders or limiting devices.

Unit is available only in 4-foot lengths for installation therein of two 40 watt, 48-inch F lamps mounted in parallel position. One-half inch knockouts are supplied at each end at intervals in top of housing for service connection. Angle hanging clips are mounted on the top of the housing at each end for attaching suspension strip, chains or messenger cable.

The housing is finished in sprayed and baked aluminum. Reflector unit is finished in durable white, baked-on, heat-resisting enamel of highest reflectivity attainable.

Limiting devices supplied with Permaflector Industrial Fluorescent Unit No. IF-248-E are for use with 110-125 Volt, 60 Cycle, AC Current. They provide high power factor of 95-100% and minimize cyclic flicker.



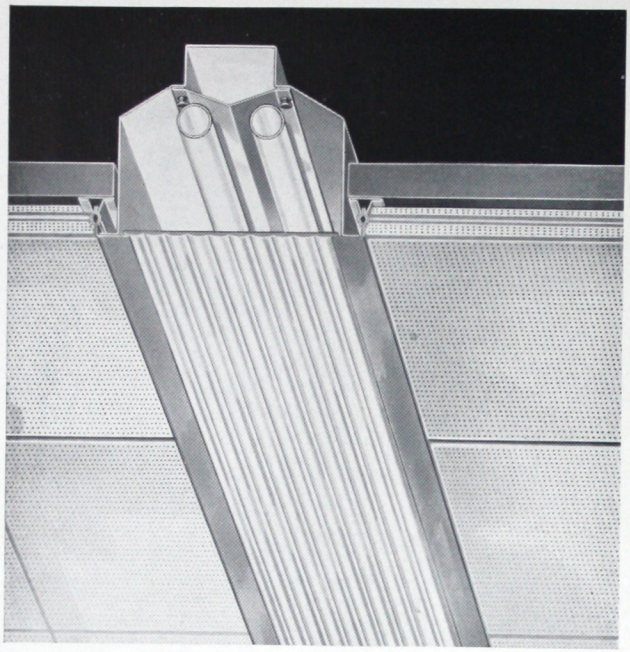
**Permaflector Industrial Flourescent Unit No. IF-248-E**

No. IF-248-E is furnished WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

**Standard Quantity** 1

| Catalog Number | F Lamps | | | Overall Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Watts | Length | Length | Width | Depth | | | |
| IF-248-E | 2 | 40 | 48″ | 48″ | 9⅛″ | 5½″ | 29 | $27.56 | INFOE |

# RECESSED FLUORESCENT TROFFERS "AF" SERIES



Cut-away section of No. AF-248-GE installed in acoustical Ceiling.

*For Snap-In Acoustical Ceiling Installations*
**Available WIRED and EQUIPPED ONLY**

Permaflector Fluorescent Troffer No. AF-148-GE accommodates a single row of 40 watt, 48-inch F lamps, while two parallel rows of 40 watt, 48-inch F lamps are provided for in No. AF-248-GE.

Each troffer contains a removable inner reflector section or wiring channel cover upon which are mounted lamps, lampholders and all limiting devices. This equipment is serviced by removing the thumb screws that hold the reflector plate in position.

"AF" Series Troffers are equipped with sections of Flutex Glass, which conceals the lamps and troffer, diffuses the light and reduces surface brightness from the lamps. Also, the Flutex Glass adds considerably to the beauty of the unit, both lighted and unlighted. Glass rests in the troffer by gravity and is removed by tipping one side upward.

"AF" Series Troffers have a special frame construction designed for installation with acoustical ceiling sections which are attached by means of the spring clip tee bar. The troffers are located and securely snapped into position between the standard 12-inch blocks of acoustical material, are butted end-to-end and overlap to form a continuous closed channel and troffer.

These troffers are attractively finished in durable sprayed and baked heat-resisting white enamel of highest reflectivity attainable.

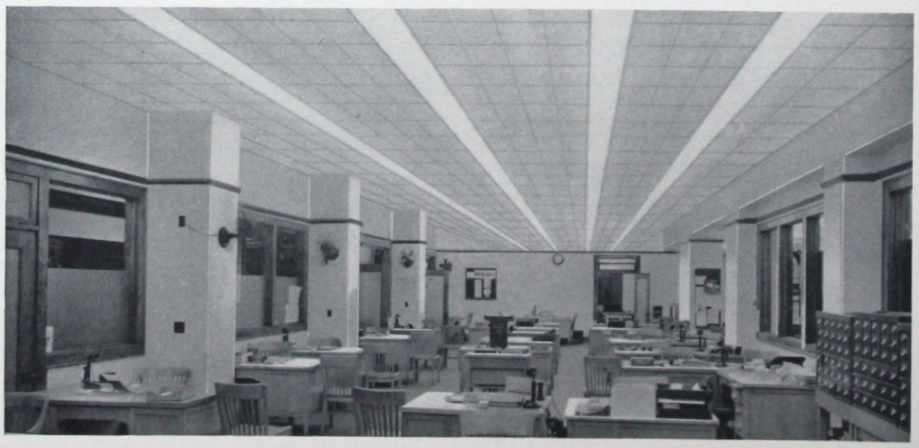
Permaflector "AF" Series Troffers are an integral part of the ceiling, blend attractively with the enameled surface of the acoustical units and provide highly efficient flourescent illumination of the finest quality.

Troffers are furnished in four standard lengths WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

**Only High Power Factor Ballasts Furnished.**

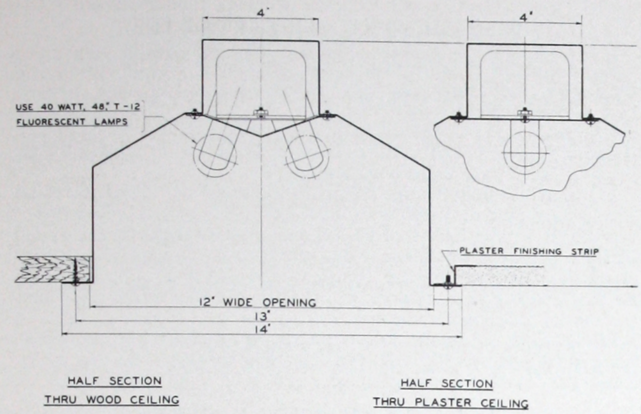
| Catalog Number | Standard Length | F Lamps | | Dimensions | | | Weight Approx. Lbs. | Retail Price (Per Foot) | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | | Number | Watts | Length | Width | Depth | | | |
| AF-148-GE | 4′ | 1 | 40 | 48″ | 12″ | 8¾″ | 42 | $ 8.78 | AFOE |
| AF-148-GE | 8′ | 2 | 40 | 48″ | 12″ | 8¾″ | 87 | 6.82 | AFATE |
| AF-148-GE | 12′ | 3 | 40 | 48″ | 12″ | 8¾″ | 127 | 7.34 | AFTUE |
| AF-148-GE | 16′ or over | | Lamps | In Line | 12″ | 8¾″ | 151 | 6.65 | AFSETE |
| AF-248-GE | 4′ | 2 | 40 | 48″ | 12″ | 8¾″ | 46 | 10.22 | AFTUFOE |
| AF-248-GE | 8′ | 4 | 40 | 48″ | 12″ | 8¾″ | 91 | 9.36 | AFTUATE |
| AF-248-GE | 12′ | 6 | 40 | 48″ | 12″ | 8¾″ | 131 | 9.52 | AFTUTUE |
| AF-248-GE | 16′ or over | | Lamps | In Line | 12″ | 8¾″ | 180 | 9.22 | AFTUSETE |

**Note: Each order for above troffer must be accompanied by either a complete lighting layout or accurate dimensions and description of the ceiling in which installation is to be made as each order is tailor-made to fit the job.**

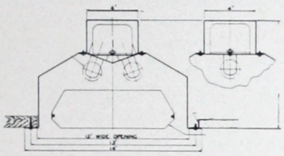


**"AF" Series Troffers form continuous bands of light which seem to be a part of the ceiling itself.**

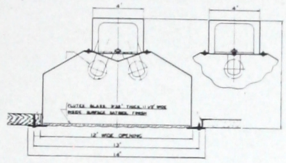
# RECESSED FLUORESCENT TROFFERS "PF" SERIES




**Cross-section of No. PF-248-E showing contour of troffer and installation arrangements for wood or plaster ceiling.**



**Cross-section of No. PF-248-LE showing louver in bottom of troffer.**



**Cross-section of No. PF-248-GE showing flutex glass panel in bottom of troffer.**

**For Plaster, Wood or Ordinary Acoustical Ceiling**

***Available WIRED and EQUIPPED ONLY***

Permaflector Fluorescent Troffers "PF" Series are equipped with extended flanges through which screws are inserted to attach the unit to the plaster, wood or ordinary acoustical ceiling. Also, "PF" Troffers are available in three styles—1. open type; 2. equipped with flutex glass panels; 3. with specially constructed louvers. The flutex glass panels and the louvers are furnished to shield the lamps and minimize glare. The louvers consist of baffle plates spaced 8 inches on centers, attached by means of rods in sections of 3 feet, 11½ inches each. Louvers can be swung open for access to lamps and auxiliaries or removed entirely for cleaning. Flutex glass panels are also removable.

No. PF-148 Series accommodates a single row of 40 watt, 48-inch F lamps.

No. PF-248 Series accommodates two parallel rows of 40 watt, 48-inch F lamps which are mounted together with auxiliaries on the removable inner reflector section and wiring channel cover.

Troffers and louvers are attractively finished in durable sprayed and baked white heat-resisting enamel of highest reflectivity attainable.

Permaflector "PF" Series Troffers are an integral part of the ceiling, blend attractively with the usual ceiling finishes and provide highly efficient fluorescent illumination of the finest quality.

"PF" Series Troffers are furnished in four standard lengths WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

**Only High Power Factor Ballasts Furnished.**

## WITH OPEN BOTTOM

| Catalog Number | Standard Length | F Lamps | | | Overall Dimensions | | Weight Approx. lbs. | Retail Price (Per Foot) | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | | Number | Watts | Length | Width | Depth | | | |
| PF-148-E | 4' | 1 | 40 | 48" | 14" | 8¾" | 38 | **$6.45** | PEFOE |
| PF-148-E | 8' | 2 | 40 | 48" | 14" | 8¾" | 80 | **4.70** | PEFATE |
| PF-148-E | 12' | 3 | 40 | 48" | 14" | 8¾" | 117 | **5.16** | PEFTUE |
| PF-148-E | 16' or over | | Lamps In Line | | 14" | 8¾" | 137½ | **4.48** | PEFSETE |
| PF-248-E | 4' | 2 | 40 | 48" | 14" | 8¾" | 42½ | **8.06** | PEFTUFOE |
| PF-248-E | 8' | 4 | 40 | 48" | 14" | 8¾" | 86 | **7.02** | PEFTUATE |
| PF-248-E | 12' | 6 | 40 | 48" | 14" | 8¾" | 127 | **7.22** | PEFTUTUE |
| PF-248-E | 16' or over | | Lamps In Line | | 14" | 8¾" | 176 | **6.80** | PEFTUSETE |

## WITH FLUTEX GLASS BOTTOM

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PF-148-GE | 4' | 1 | 40 | 48" | 14" | 8¾" | 53 | **8.46** | PEFOGE |
| PF-148-GE | 8' | 2 | 40 | 48" | 14" | 8¾" | 95 | **6.84** | PEFATGE |
| PF-148-GE | 12' | 3 | 40 | 48" | 14" | 8¾" | 132 | **7.24** | PEFTUGE |
| PF-148-GE | 16' or over | | Lamps In Line | | 14" | 8¾" | 152 | **6.62** | PEFSETGE |
| PF-248-GE | 4' | 2 | 40 | 48" | 14" | 8¾" | 57 | **9.94** | PEFTUFOGE |
| PF-248-GE | 8' | 4 | 40 | 48" | 14" | 8¾" | 101 | **8.78** | PEFTUATGE |
| PF-248-GE | 12' | 6 | 40 | 48" | 14" | 8¾" | 142 | **9.02** | PEFTUTUGE |
| PF-248-GE | 16' or over | | Lamps In Line | | 14" | 8¾" | 191 | **8.56** | PEFTUSETGE |

## WITH BAFFLE LOUVER BOTTOM

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PF-148-LE | 4' | 1 | 40 | 48" | 14" | 8¾" | 40 | **7.74** | PEFOLE |
| PF-148-LE | 8' | 2 | 40 | 48" | 14" | 8¾" | 85 | **5.88** | PEFATLE |
| PF-148-LE | 12' | 3 | 40 | 48" | 14" | 8¾" | 124 | **6.36** | PEFTULE |
| PF-148-LE | 16' or over | | Lamps In Line | | 14" | 8¾" | 148 | **5.66** | PEFSETLE |
| PF-248-LE | 4' | 2 | | 48" | 14" | 8¾" | 45 | **9.26** | PEFTUFOLE |
| PF-248-LE | 8' | 4 | | 48" | 14" | 8¾" | 91 | **8.22** | PEFTUATLE |
| PF-248-LE | 12' | 6 | | 48" | 14" | 8¾" | 134 | **8.42** | PEFTUTULE |
| PF-248-LE | 16' or over | | Lamps In Line | | 14" | 8¾" | 187 | **8.00** | PEFTUSETLE |

**NOTE: Each order for above troffer must be accompanied by either a complete lighting layout or accurate dimensions and description of ceiling in which installation is to be made as each order is tailor-made to fit the job.**

# PERMAFLECTOR FLUORESCENT LUMINAIRES

## TYPES AND DESIGN

These luminaires are available for installation therein of 40 watt, 48-inch F lamps in quantities of two, three, four and six; may be installed surface mounted or suspension mounted and include (as optional equipment) an embossed crystal plastic cover of cylindrical shape to conceal the lamps and minimize glare. With the exception of Catalog No. SF-648 Series, which is a direct-indirect type of unit, all Permaflector F Luminaires supply direct illumination.

A singular basic design idea is inherent in all Permaflector F Luminaires—each luminaire consists of two or more specially designed trough reflectors of pre-tested efficiency permanently joined adjacently into a one-piece housing. This ideal design method provides an individual reflector for every lamp thereby controlling the maximum output per lamp; equally balances the lamps symmetrically on either side of the axis of the unit which provides uniform brightness on the unit itself and broad coverage and efficient distribution of the light flux from the lamps.

The addition of a metal cover and decorative specially-designed ends to the housing completes the chassis which accommodates limiting devices, wiring, sockets, lamps and starters. The entire housing can be quickly opened for servicing of inner equipment by removing the screws which hold it to the cover.

Decorative metal end rings are skillfully designed and mounted to trap a subordinate spill of light which illuminates the inner end plate and eliminates the objectionable contrast of dark ends.

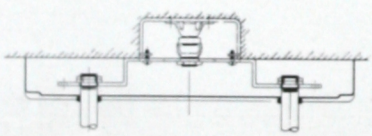
Surface mounted ceiling units are comprised of the chassis only; suspension mounted units include a special hanger assembly attached to the cover of the chassis.

## MATERIALS AND FINISHES

Chassis, hanger assembly and end plates on Permaflector F Luminaires are constructed of sheet steel attractively finished in a special baked-on, heat-resisting white enamel of highest reflectivity attainable. It is durable, permanent and, being neutral in color, harmonizes with any interior.

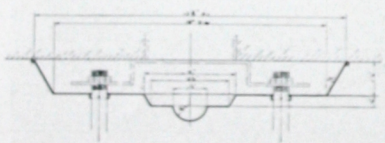
End rings are made of spun steel and are available finished in gleaming **Scratched Gun Metal.**

## HANGER ASSEMBLIES



**Cross-section of rectangular canopy.**

Hanger assemblies for suspension - mounted Permaflector F Luminaires consist of two steel pipe stems which attach directly to the cover of the chassis and are inserted in the rectangular - shaped canopy as shown in the accompanying cross section sketch. The heavy steel strap inside the canopy supports the weight of the unit.



**Cross-section of circular canopy No. B-555**

Special Circular Canopy, Catalog No. B-555, for use with suspension mounted Permaflector F Luminaires is available **at additional cost** for installations where existing exposed outlet boxes or rosettes must be covered. Canopy No. B-555 must be indicated on the order together with the catalog number of the luminaire—not available separately.

**Standard Quantity**—1 **Diameter:** 13¾ inches.

**Retail Price Each (additional)** ..... **$1.30**

## INSTALLATION

Ceiling Mounted Permaflector F Luminaires are equipped with two center knockouts in cover for wiring and attaching to ⅜-inch stud. Four additional screw holes at ends are furnished for firmly securing cover to ceiling.

Suspension mounted Permaflector F Luminaires may be attached to 3¼-inch or 4-inch outlet box by means of screws or fixture stud or directly to the ceiling by means of screws.

## WIRING AND AUXILIARIES

Permaflector F Luminaires are available unwired and not equipped including chassis, hanger assembly and special brick-type ballast connector only or wired and completely equipped with ballasts, starting compensators and lamp holders. FS Starters and F Lamps must be purchased separately from your local supplier.

Limiting devices supplied with Permaflector F Luminaires are for use with 110-125 Volt, 60 Cycle, AC current. They provide high power factor of 95-100 per cent and minimize cyclic flicker. Starting Compensators, which are often eliminated to decrease the cost of the fixtures, are always supplied with Permaflector F Luminaires as they insure satisfactory lamp life and lumen maintenance.

Wired and equipped units are designated in the specifications accompanying each unit by the addition of the suffix letter "E" to the catalog number.

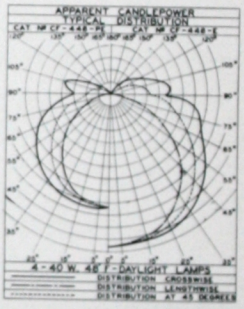
## "PERMACO" ENCLOSURES

Permaflector F Luminaires are available with or without Permaco enclosures. Units equipped with Permaco enclosures are designated in the specifications accompanying each unit by the addition of the suffix letter "P" to the catalog number.

These Permaco enclosures are specially designed for Permaflector F Luminaires to conceal the lamps and housing and reduce the surface brightness from the lamps. They consist of crystal cellulose acetate which is durable and highly efficient in light transmission. This plastic is embossed with a suitable design that provides a glareless, highly diffused light. It is light in weight and resistant to breakage as contrasted with glass. Permaco equipped Permaflector F Luminaires are unusually beautiful, both lighted and unlighted.

Permaco enclosures may be quickly and easily removed for servicing of lamps and starters by removing the ends of the chassis and loosening the side screws which fasten the plastic to the chassis.

The distribution chart reproduced herewith illustrates as a typical example the effect of the plastic enclosure upon the distribution of light from Permaflector Luminaire No. CF-448-E. Curves at the left of the chart show the distribution of light from the plastic enclosed Luminaire No. CF-448-PE.



**Servicing Lamps on Permaco Covered Luminaire No. CF-448-PE. Work is done quickly and simply . . . no tools are required . . . one man does the work.**

# PERMAFLECTOR FLUORESCENT LUMINAIRES

## CONSTRUCTION, INSTALLATION AND PERFORMANCE ADVANTAGES

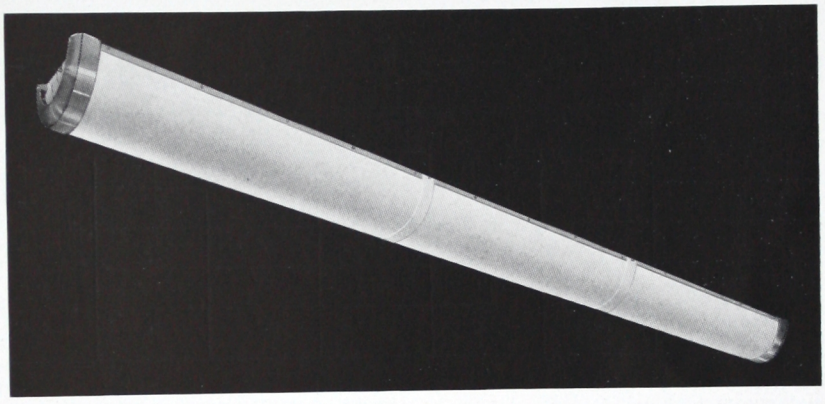
The new, distinctively styled Permaflector F Luminaires offer many salient qualities to those who install, specify or use fluorescent luminaires for commercial purposes. A few of these are:

1. **Illuminated ends eliminate dark contrasts.**
2. **Multiple reflector unit design method provides uniform surface brightness.**
3. **New, improved efficiency and light distribution.**
4. **High power factor, minimized cyclic flicker, peak lamp efficiency by complete, performance-proved ballast equipment.**
5. **Choice of four intensities, two distribution types, surface mounted or suspended units open or plastic covered units, and single units or continuous runs.**
6. **Design and finish appropriate for all interiors.**
7. **Quick, trouble-free, economical installation, servicing and maintenance.**

## PERMAFLECTOR LUMINAIRES FOR CONTINUOUS RUNS

Each of the Permaflector Fluorescent Luminaires listed herein is available for installation in continuous runs of any length divisible by four feet, which is the standard length of each fixture. Continuous runs of Permaflector F Luminaires include the specified number of luminaires, two standard decorative ends and the required number of intermediary coupling plates and bands.

The coupling plates overlap the ends of each fixture, provide the means of bolting the units together and support the outer steel strap which conceals the joint. All coupling parts are finished in white, baked-on enamel which is the same finish as the luminaire housing.



**Three Luminaires No. CF-448-PE installed in continuous run of 12 feet.**

Permaflector F Luminaires for continuous runs **are priced the same as the standard fixtures.** The price of a continuous run is, therefore, obtained by multiplying the number of units required times the cost of the single luminaire selected for the run.

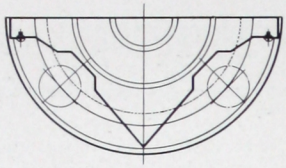
### HOW TO ORDER LUMINAIRES IN CONTINUOUS RUNS

Orders for continuous runs of Permaflector F Luminaires **must invariably specify the length of each continuous run, list the quantity of luminaires and catalog number.** For example, two continuous 48-foot runs of WIRED and EQUIPPED Luminaire No. CF-448-PE should be ordered as follows: "Two 4-8 foot continuous runs, 24—No. CF-448-PE".

**Permaflector F Luminaires No. CF-448-E**
Installed in Diamond Dept. Store, Charleston, W. Va.

**Permaflector F Luminaires No. CF-448-E**
Installed in Perl & Reichbaum Food Market, Pittsburgh, Pa.
Architect, Clifford A. Lake.

# PERMAFLECTOR FLUORESCENT LUMINAIRES



Cross Section of No. CF-248 Series Showing Shape of Housing

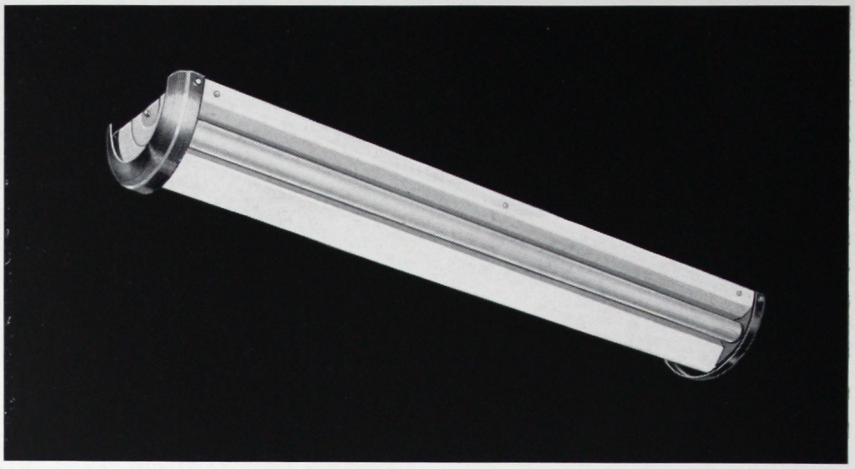
## NO. CF-248 SERIES

### DIRECT ILLUMINATION FOR SURFACE MOUNTING

**Standard Quantity**—1

**One Tulamp Ballast Furnished with Wired Units.**

**No. CF-248**



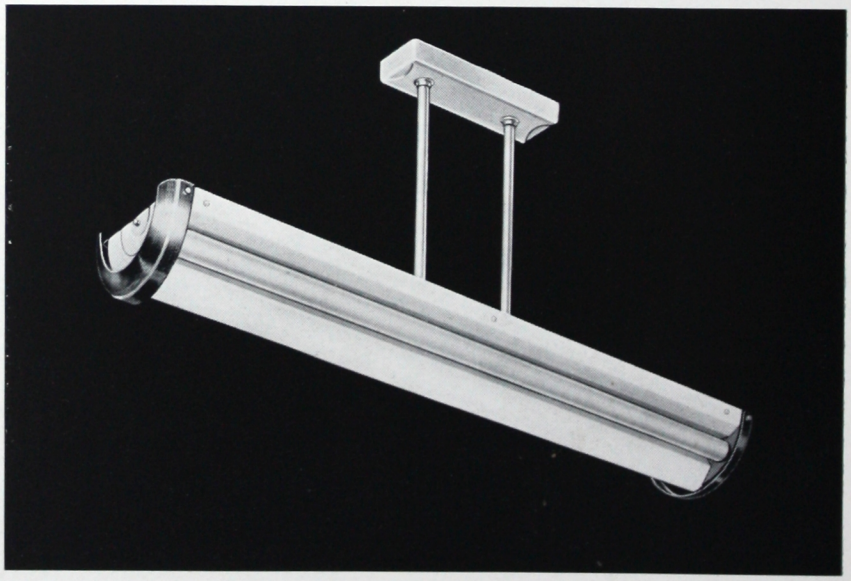
| Catalog No. | F Lamps | | | Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Depth | Width | Length | | | |
| *CF-248 | 2 | 40 | 48″ | 5″ | 10″ | 50″ | 20 | $13.42 | SEFTU |
| ‡CF-248-P | 2 | 40 | 48″ | 5″ | 10″ | 50″ | 32 | 28.82 | SEFTUP |
| †CF-248-E | 2 | 40 | 48″ | 5″ | 10″ | 50″ | 29 | 26.96 | SEFTUE |
| §CF-248-PE | 2 | 40 | 48″ | 5″ | 10″ | 50″ | 41 | 42.36 | SEFTUPE |

*Luminaire Only—NOT WIRED and NOT EQUIPPED.

‡Luminaire with Plastic Enclosure—NOT WIRED and NOT EQUIPPED.

†Luminaire WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

§Luminaire with Plastic Enclosure—WIRED and EQUIPPED as listed above.



## NO. SF-248 SERIES

### DIRECT ILLUMINATION FOR SUSPENSION MOUNTING

**Standard Quantity**—1

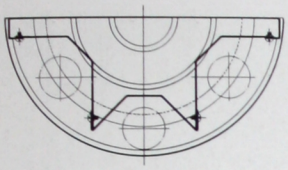
**One Tulamp Ballast Furnished with Wired Units.**

**No. SF-248**

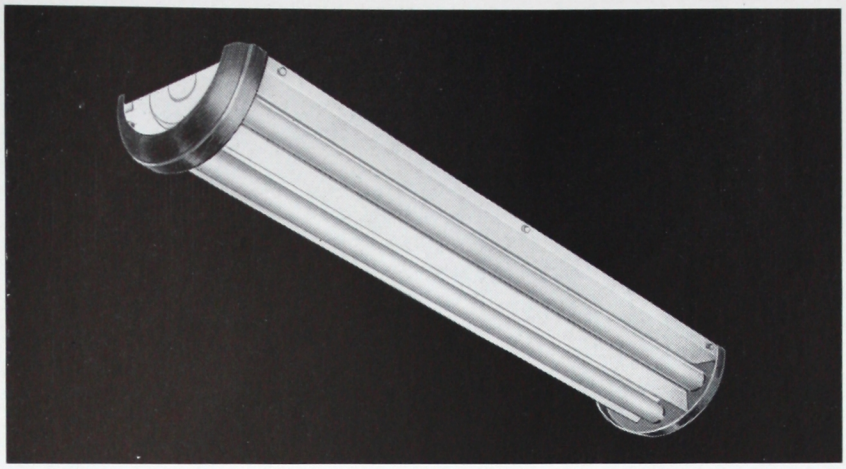
| Catalog No. | F Lamps | | | *Standard Suspension | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Cover to Ceiling | Overall | | | |
| *SF-248 | 2 | 40 | 48″ | 31″ | 36″ | 26 | $18.26 | ESEFTU |
| ‡SF-248-P | 2 | 40 | 48″ | 31″ | 36″ | 38 | 33.66 | ESEFTUP |
| †SF-248-E | 2 | 40 | 48″ | 31″ | 36″ | 35 | 31.58 | SEEFTUE |
| §SF-248-PE | 2 | 40 | 48″ | 31″ | 36″ | 47 | 46.98 | ESEFTUPE |

*For shorter than standard suspension add $0.60 cutting charge.
*For longer than standard suspension add $0.10 per additional inch of suspension plus $0.60 cutting charge.

# PERMAFLECTOR FLUORESCENT LUMINAIRES



Cross Section of No. CF-348 Series
Showing Shape of Housing



## NO. CF-348 SERIES

### DIRECT ILLUMINATION FOR SURFACE MOUNTING

**Standard Quantity**—1

**One Tulamp and One Single Lamp Ballast Furnished with Wired Units.**

**No. CF-348**

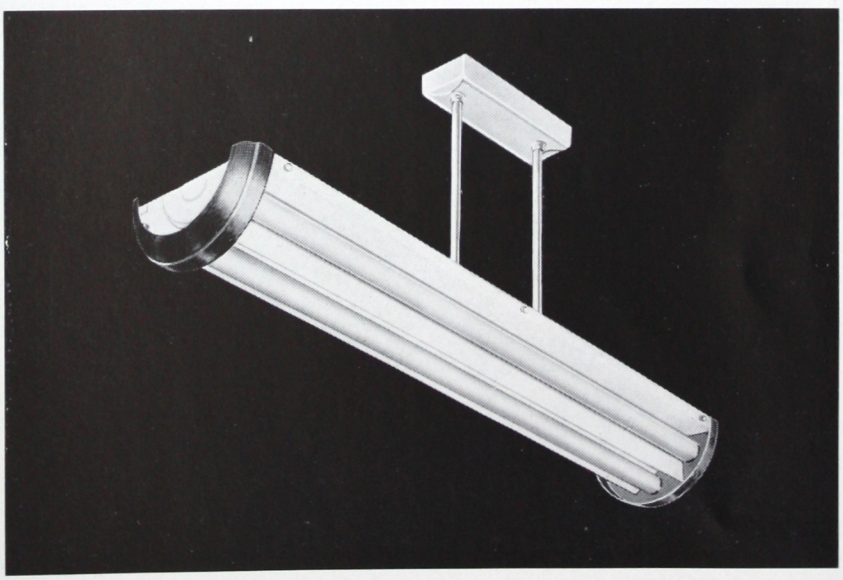
| Catalog No. | F Lamps | | | Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Depth | Width | Length | | | |
| *CF-348 | 3 | 40 | 48″ | 5″ | 10″ | 50″ | 24 | **$16.50** | SEFTRE |
| ‡CF-348-P | 3 | 40 | 48″ | 5″ | 10″ | 50″ | 36 | **31.90** | SEFTREP |
| †CF-348-E | 3 | 40 | 48″ | 5″ | 10″ | 50″ | 38 | **40.04** | SEFTREE |
| §CF-348-PE | 3 | 40 | 48″ | 5″ | 10″ | 50″ | 50 | **55.44** | SEFTREPE |

*Luminaire Only—NOT WIRED and NOT EQUIPPED.

‡Luminaire with Plastic Enclosure—NOT WIRED and NOT EQUIPPED.

†Luminaire WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

§Luminaire with Plastic Enclosure—WIRED and EQUIPPED as listed above.



## NO. SF-348 SERIES

### DIRECT ILLUMINATION FOR SUSPENSION MOUNTING

**Standard Quantity**—1

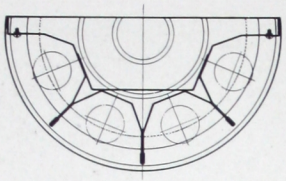
**One Tulamp and One Single Lamp Ballast Furnished with Wired Units.**

**No. SF-348**

| Catalog No. | F Lamps | | | *Standard Suspension | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Cover to Ceiling | Overall | | | |
| *SF-348 | 3 | 40 | 48″ | 31″ | 36″ | 29 | **$21.12** | ESEFTRE |
| ‡SF-348-P | 3 | 40 | 48″ | 31″ | 36″ | 41 | **36.52** | ESEFTREP |
| †SF-348-E | 3 | 40 | 48″ | 31″ | 36″ | 43 | **44.66** | ESEFTREE |
| §SF-348-PE | 3 | 40 | 48″ | 31″ | 36″ | 55 | **60.06** | ESEFTREPE |

*For shorter than standard suspension add $0.60 cutting charge.
*For longer than standard suspension add $0.10 per additional inch of suspension plus $0.60 cutting charge.

# PERMAFLECTOR FLUORESCENT LUMINAIRES



Cross Section of No. CF-448 Series Showing Shape of Housing

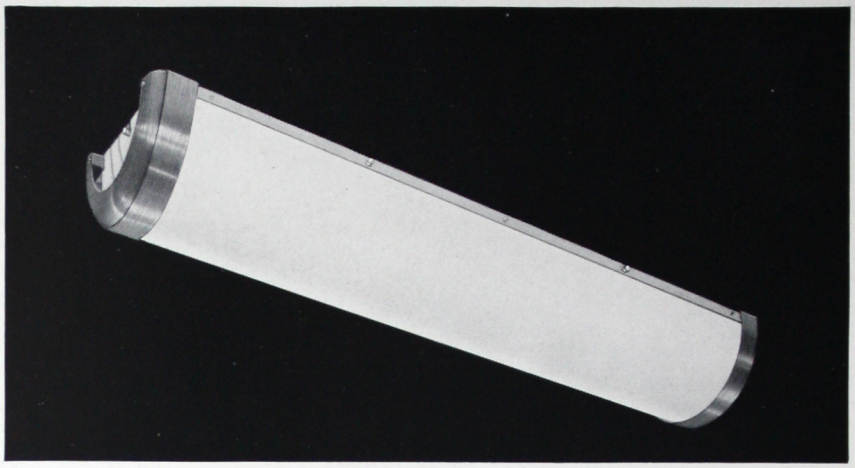
## NO. CF-448 SERIES

### DIRECT ILLUMINATION FOR SURFACE MOUNTING

**Standard Quantity—1**

**Two Tulamp Ballasts Furnished with Wired Units.**

**No. CF-448-P**



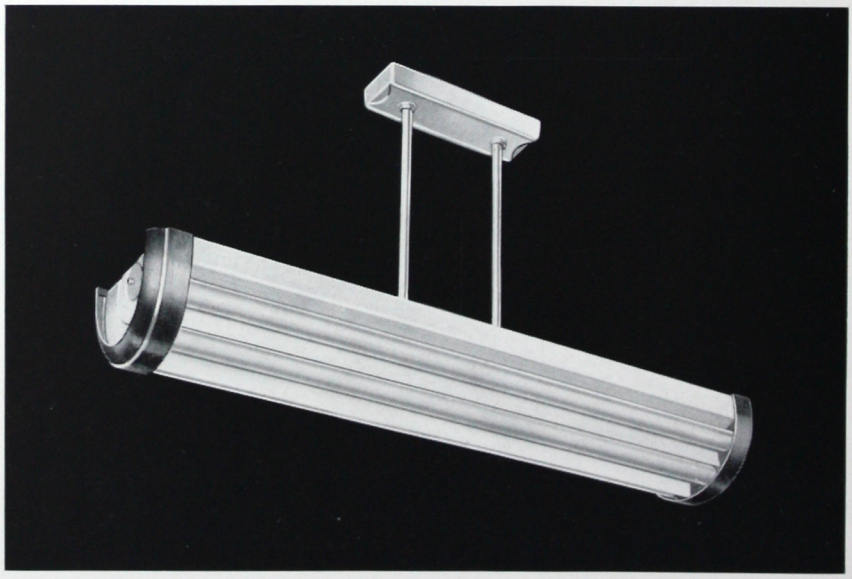
| Catalog No. | F Lamps | | | Dimensions | | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Depth | Width | Length | | | |
| *CF-448 | 4 | 40 | 48″ | 6 1/8″ | 10 7/8″ | 50″ | 29 | **$21.78** | SEFO |
| ‡CF-448-P | 4 | 40 | 48″ | 6 1/8″ | 10 7/8″ | 50″ | 41 | **37.18** | SEFOP |
| †CF-448-E | 4 | 40 | 48″ | 6 1/8″ | 10 7/8″ | 50″ | 48 | **46.20** | SEFOE |
| §CF-448-PE | 4 | 40 | 48″ | 6 1/8″ | 10 7/8″ | 50″ | 60 | **61.60** | SEFOPE |

*Luminaire Only—NOT WIRED and NOT EQUIPPED.

‡Luminaire with Plastic Enclosure—NOT WIRED and NOT EQUIPPED.

†Luminaire WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

§Luminaire with Plastic Enclosure—WIRED and EQUIPPED as listed above.



## NO. SF-448 SERIES

### DIRECT ILLUMINATION FOR SUSPENSION MOUNTING

**Standard Quantity—1**

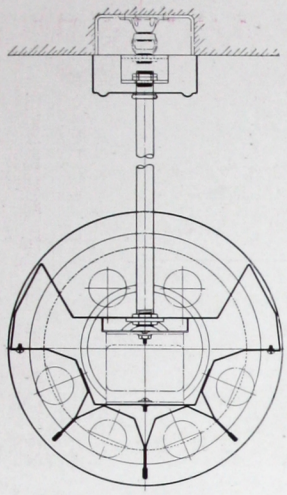
**Two Tulamp Ballasts Furnished with Wired Units.**

**No. SF-448**

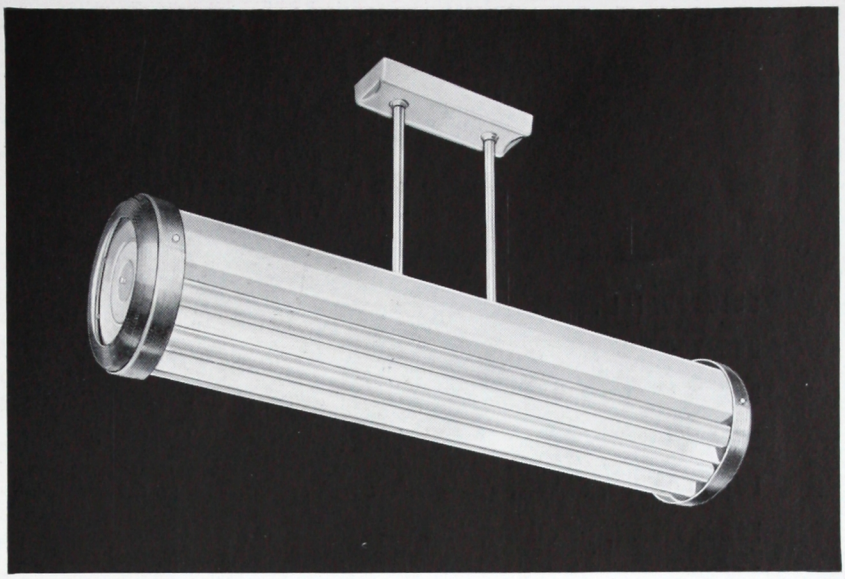
| Catalog No. | F Lamps | | | *Standard Suspension | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Cover to Ceiling | Overall | | | |
| *SF-448 | 4 | 40 | 48″ | 29 7/8″ | 36″ | 34 | **$26.40** | ESEFO |
| ‡SF-448-P | 4 | 40 | 48″ | 29 7/8″ | 36″ | 46 | **41.80** | ESEFOP |
| †SF-448-E | 4 | 40 | 48″ | 29 7/8″ | 36″ | 54 | **51.70** | ESEFOE |
| §SF-448-PE | 4 | 40 | 48″ | 29 7/8″ | 36″ | 66 | **67.10** | ESEFOPE |

*For shorter than standard suspension add $0.60 cutting charge.
*For longer than standard suspension add $0.10 per additional inch of suspension plus $0.60 cutting charge.

# PERMAFLECTOR FLUORESCENT LUMINAIRES



**Cross Section of No. SF-648 Series Showing Shape of Housing and Hanger Assembly.**



**No. SF-648, Illustrated Above**

## NO. SF-648 SERIES

### DIRECT-INDIRECT ILLUMINATION FOR SUSPENSION MOUNTING

**Standard Quantity—1**
**Three Tulamp Ballasts Furnished with Wired Units.**

*Luminaire Only—NOT WIRED and NOT EQUIPPED.

‡Luminaire with Plastic Enclosure—NOT WIRED and NOT EQUIPPED.

†Luminaire WIRED and EQUIPPED with ballasts, starting compensators, lampholders and starter sockets—FS starters and F lamps are NOT included.

§Luminaire with Plastic Enclosure—WIRED and EQUIPPED as listed above.

| Catalog No. | F Lamps | | | *Standard Suspension | | Weight Approx. Lbs. | Retail Price Each | CODE |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Watts | Length | Cover to Ceiling | Overall | | | |
| *SF-648 | 6 | 40 | 48″ | 25″ | 36″ | 41 | $35.20 | SEFSI |
| ‡SF-648-P | 6 | 40 | 48″ | 25″ | 36″ | 53 | 50.60 | SEFSIP |
| †SF-648-E | 6 | 40 | 48″ | 25″ | 36″ | 70 | 77.00 | SEFSIE |
| §SF-648-PE | 6 | 40 | 48″ | 25″ | 36″ | 82 | 92.40 | SEFSIPE |

*For shorter than standard suspension add $0.60 cutting charge.
*For longer than standard suspension add $0.10 per additional inch of suspension plus $0.60 cutting charge.

## DESIGNING THE FLUORESCENT LUMINAIRE INSTALLATION

Most electrical contractors, lighting service specialists and engineers understand and are experienced in the design of fluorescent lighting installations. The lamp manufacturers have published complete fluorescent illumination design data from which experienced persons can calculate the required data for each installation and we recommend that it be used.

The more limited and condensed rule of thumb data which space limitations would compel us to present herein would be insufficient, as such data can only cover average conditions. When the actual conditions represent extremes such data gives misleading high or low results.

To those customers who require fluorescent illumination design assistance or who prefer our methods, we make available complete fluorescent lighting layouts as a part of the Permaflector Engineering Service. Consult your local Permaflector Representative or write direct to our engineering headquarters in Pittsburgh.

# PERMAFLECTOR SALES REPRESENTATIVES

## BRANCH OFFICES

CHICAGO, ILL., . . . . . R. O. Williams, Mgr., 1158 Merchandise Mart. (Superior 0970-1).

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SAN FRANCISCO, CALIF., . . . . . H. A. Gardner, 807 Flatiron Bldg. (Garfield 1885).

DETROIT, MICH., . . . . . J. Morris Jones, 10366 Orangelawn Ave. (Hogarth 5156).

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KANSAS CITY, MO., . . . . . Mervin Simons, 615 Manufacturers Exchange Bldg. (Harrison 2768).

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ATLANTA, GA., . . . . . M. L. Whitman, Bona Allen Building (Walnut 0977).

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BOSTON, MASS., . . . . . Detweiler-Bell Co., 25 South St. (Hancock 6191).

BUFFALO, N. Y., . . . . . H. H. Mallon, 368 Elm St. (Washington-2004).

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CINCINNATI, OHIO, . . . . . Carl R. Busch, 626 Broadway (Cherry-2440).

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MINNEAPOLIS, MINN., . . . . . Balch Sales Co., 417 South Sixth St. (Main 8758).

PHILADELPHIA, PA., . . . . . Hopkin Bros., Inc., 116 N. 7th St. (Lombard 8368).

RUTHERFORD, N. J., . . . . . H. G. Otis, 131 Woodward Ave. (Rutherford 2-4740).

SALT LAKE CITY, UTAH, . . . . . Raymond Ackerman, 318 Dooly Block (5-2322).

ST. LOUIS, MO., . . . . . M. J. Cleary Co., 1217 Louderman Bldg., (Central 0153).

WASHINGTON, D. C., . . . . . Sam Masland, 410 Bond Building (National 3934).

PITTSBURGH REFLECTOR COMPANY
OLIVER BUILDING, PITTSBURGH, PENNSYLVANIA

"Pittsburgh" Permaflectors

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